

ETHICAL AND RESPONSIBLE BEHAVIOR FOR
CHILDREN TO SENIOR CITIZENS IN THE INFORMATION AGE

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I. Communications Technology in the Information Age

In this age, communications technology has transformed our lives and changed the ways we communicate. For the purpose of this paper, communications technology includes: computers and information systems such as Local Area Networks (LANs), Wide Area Networks (WANs); fax machines and fax modems; personal communication services, such as, cellular and portable telephones, paging systems, voice mail, and the telecommunications infrastructure that enables populations to communicate via inter-networked systems.

Although this age is fascinating, it is far from golden. Users of computers and information systems must come to grips with the vulnerabilities inherent within inter-networked systems. Equally important is the issue that users need to learn how to apply the tools available on these systems in an ethical and responsible manner.

II. Double-Edged Sword

As a result of the development and use of computer and telecommunications technologies, our world has gotten smaller. For example, the Internet Telnet protocol allows users to visit different computers around the world. File Transfer Protocol (FTP) permits users to obtain files (including freeware and

shareware) from other computers. Gopher and Veronica enable users to conduct information retrieval searches, and the Worldwide Web's (WWW) powerful search engines -- such as those available from Lycos[®], Alta Vista[®], and Yahoo[®] -- make it easy to conduct research around the globe from a computer in one's home, school or office.

Unfortunately the same tools that come to the aid of humanity and bring people together to work and play in the Information Age, can be used for a variety of unethical and criminal behaviors. We could be victims of white collar criminals using information systems.

Because users can be careless, unaware, and uneducated about information security, they often fail to protect their information. For example, hard disks do crash. It is not a question of whether a disk will crash, but when! It is therefore good business practice to perform backups. Many busy users however, get careless and don't back up their data. Many users, unaware of the problems that a computer virus may cause, do not install and use current programs that scan software for viruses. By not practicing good information security, users may become victims due to their own carelessness and/or lack of awareness and education.

Users may also become victimized by others' unethical or irresponsible behavior. Examples of such behavior include: phone fraud and electronic stalking or harassment, extortion, placing pirated software on a Bulletin Board System (BBS), or disseminating malicious software such as viruses, worms, Trojan Horses, or Logic Bombs. Victimiziers include computer criminals and others who go astray or are lead astray by these criminals.

Readers of newspapers and publications on computer and information security are witness to headlines such as: "Clinton death threat is traced to Monte Vista High computer" [1], "Charges for Juvenile" [2], and "Pupils Cautioned for Card Fraud" [3]. The National Computer Security Association devoted an entire issue of its journal to ethics, with articles such as: "Totem and Taboo in Cyberspace," "A Question of Privacy," and "Why Hackers Do the Things They Do" [4].

The all-to-frequent articles about children committing computer crimes suggest that we as information security practitioners, must become pro-active in our efforts to change this situation. Inter-networked citizens must learn to practice responsible behaviors. As professionals, we must take the lead to ensure that computer users, our own and future generations, learn to use the inter-networked systems responsibly. Responsible and ethical behaviors need to be

positively reinforced. Ethics in cyberspace needs to become normal, acceptable, and expected behavior.

III. Programs and Services

Many organizations that offer a variety of programs and services to the inter-networked global community are working toward that end. It is my honor to serve as a volunteer for one of them, ICICX -- International Community Interconnected Computing eXchange[©]. ICICX is a United States non-profit, charitable, scientific research and educational organization; its involvements are directed to the focused design, development, implementation and support of various Information Technology (IT)/Information Systems (IS) related services for the use of the inter-networked global community.

ICICX is composed of four directorates which shall focus to extend the benefit of their work to populations which ICICX recognizes as its constituency:

The first is CDTIES: Curriculum Development Technology Integration & Educational Services[©]. This is ICICX's Education Directorate, which will work hand-in-hand with educators, administrators, student leaders, and parents. It intends to define and develop curricula that encourage the integration of computers and information systems in a variety of educational environments, such as schools, home schools, libraries or other community centers.

The second directorate is IITCPD: Internetworked -- Information & Telematic Community Programs Development[©]. The effort of this ICICX Directorate focuses on working within a global community to survey and assess the telematic and informatic needs of a population. It is also the function of this directorate to pair programmatic, systemic, and specific service elements to the needs of populations.

Third we have ITS RDP: Informatic - Telematic Sciences Research Development & Practice[©]. This directorate focuses its attention on surveying, analysis, and reporting on topic areas such as information infrastructure: elements of telecommunications and information systems. ITS RDP is also a research and development arm of ICICX and will design and develop tools, services and materials technology. It will look at the ever changing environment and its impact on a society that has become dependent on using inter-connected systems.

The last, and most pertinent for my purpose today, is CISSRP: Computer-Information Systems Security, Research & Practice[©]. The programmatic areas of this directorate include several Policy Focus Areas; Awareness, Education, and Training for users of all ages, from children to senior citizens; Programs to reinforce positive and ethical behaviors within inter-networked systems; and

Information about innovations in security for computer and information systems.

I volunteer my time away from my job at Lawrence Livermore National Laboratory (LLNL) to work with ICICX through its CISSRP Directorate. At LLNL, I am the Coordinator for Computer Security Training, Education and Awareness. In that position I design, develop and conduct training courses and produce awareness materials for LLNL personnel who need to protect information on LLNL computers and information systems in accordance with the U.S. Department of Energy's (DOE) Orders and LLNL policies. My work with ICICX/CISSRP will enable me to apply much of what I do on the job to a larger and more diverse community -- the inter-networked global community. As you well know, we face a Herculean task in raising awareness within this community and educating it about using information systems responsibly and securely.

ICICX, its board of directors, and directorates are a composite of a diversified virtual community. Since its members do not live near each other, there is a dependence on using communications and information technologies to interact, create, work, and recreate. We use a mixture of E.mail, real time inter-active sessions via the Internet, telephone, and faxes.

IV. Awareness, Education and Training

CISSRP plans to use awareness as a key ingredient to share concerns about the need to protect information and the importance of respecting authorship. This life-long process of awareness, education, and training needs to begin with young children and continue throughout their adult lives. The increasing numbers who communicate over the inter-networked systems need to be cognizant of basics such as these:

1. To Make a Good Password:
 - Don't use personal information.
 - Don't use dictionary words, in any language, spelled forward or backwards.
 - Do combine letters and numbers to make a password that is easy for you to remember and hard for someone else to guess.
2. The Importance of Frequently Backing Up Information. Disks do crash.
3. How to Combat Viruses. Users need to understand:
What malicious software can do to a computer system and how to use current virus scanning software to detect and eradicate viruses.
4. Respect For Intellectual Property: Copyright, Trademark, Patent and Trade Secrets.

ICICX will use cartoon characters it has developed to share information on these and other information security areas with the global inter-networked community. This community is composed of a variety of generations. Senior citizens who have the desire to use computers need awareness, education, and training, just as much as children do.

V. Inter-networked Co-Learners

As participants in this community, we need to grow and expand our horizons together. Often, as we all know, learning about telematic and informatic technologies can be a frustrating experience. So we need to feel comfortable asking someone for help. Adults and children can be co-learners and co-educators, bridging generation gaps and helping one another to embrace the technologies of the Information Age.

To facilitate this process, ICICX has created a variety of cartoon characters who are user-friendly helpers. One such character was created to help users understand that the computer is a tool which does what it is requested to do. Frequently, users attempt to execute commands on an information system without really comprehending what the result of their actions might be. Many users get tangled and frustrated when attempting to use a computer or software programs and berate the system for not being a mind reader.

Another character we created struggles to understand how certain elements function within inter-networked systems. By providing engaging characters to facilitate learning through the ICICX Web Site and other educational materials, we hope to alleviate the anxiety felt by many new computer users of all ages.

CISSRP believes that learning is a life-long process that does not stop when one reaches retirement age. Senior citizens who retire at the age of fifty-five to sixty-five will expect to remain active as participants within society for many years past their retirement. Some senior citizen centers and libraries have computers for community members to use. With the decreased cost of hardware and software in the past few years, increased participation from senior citizens in the Information Age is an increasingly evident trend. Many purchase a computer system for use in their homes. In some cases, grown children bestow their senior citizen parents with the necessary tools to participate in the Information Age. Therefore, many of our senior citizens in the United States are embracing the Information Age along with their grandchildren.

Senior citizens have the ability communicate with members of their own age group and others in the larger global on-line community, thereby, narrowing the gap between the generations. SeniorNet through the use of the Worldwide Web (WWW) provides its participants the opportunity to enter into discussions and share a variety of subjects of particular interest to them. By accessing inter-networked systems, this segment of the population remains in communication with friends and colleagues, from the convenience of their homes and local communities.

CISSRP believes that our senior citizens have a wealth of information that could measurably enhance the lives of younger generations. Both seniors and youth could benefit from sharing their diversified knowledge bases with each other. CISSRP believes that seniors could serve as positive role models for our youth. Their maturity and ethical values may be shared with youngsters who are themselves beginning to expand their horizons.

CISSRP is equally concerned with the senior citizen community who are participating in the Information Age. Senior citizens may be unaware of the vulnerabilities that computer users can experience. CISSRP believes that this segment of our population is in as much need of information security awareness, education, and training as our youths are.

VI. Policies for an Inter-networked Global On-line Community

Every society follows rules and policies that enable it to co-exist. Drivers of motor vehicles are required to operate them according to federal, state, and local rules of the road. We vote for candidates to represent our interests. Some of us may involve ourselves in community organizations. In each of case, rules and policies exist which we as responsible citizens, agree to follow.

A Global On-line community has similar needs to our societal communities. Participants in this community must have policies that enable us to communicate responsibly and safely.

One of CISSRP's programmatic areas is Computer-Information Security Policies. Within this area, CISSRP will conduct research on a variety of policies and thus provide a place to share this information. CISSRP will collaborate with the ICICX Directorates that deal with education and community relations, to conduct and share research within communities that use inter-networked systems.

More broadly, areas of policy that interest CISSRP include: Values for the Inter-Networked Community, Ethics for the Inter-Networked Community, Essential Etiquette for the Inter-Networked Community, Guiding Principles, Responsible/Acceptable Usage Policies, Intellectual Property and Software/Hardware Piracy Issues.

VII. Resources

Within our society we have libraries, television, radio, newspapers, educational institutions, and on-line systems that provide us a wealth of information resources.

Analogously, CISSRP's Programmatic Area of Computer-Information Security Practice shall endeavor -- through Awareness, Education and Training -- to provide a central repository of pertinent resources for computer and information security practitioners. Within this programmatic area on the ICICX/CISSRP Web Site, you will find, "ICICX References," that will include information about:

- Videos -- Vendors and video titles with short descriptions of the videos and points of contact for ordering them.
- Organizations -- such as: American Society for Industrial Security (ASIS), Computer Ethics Institute (CEI), Computer Security Institute (CSI), Information Systems Security Association (ISSA), and National Computer Security Association (NCSA) [5].
- Materials -- where one may order Information Security Awareness materials, from outlets such as: National Computer Security Center (NCSC), CSI, NCSA, and Software Publishers Association (SPA) [6].
- Outreach Programs -- through ICICX and organizations involved in collaborative and cooperative agreements with it.
- Training -- Distance Learning through ICICX/CISSRP.

The cornerstone of ICICX/CISSRP's mission is a commitment to shape young populations, by a pro-active approach stressing Awareness, Education, and Training. Let us teach our youth now! Then, as they begin to use the inter-networked systems, they will use them responsibly and avoid irresponsible practices as they mature. CISSRP has in development a Children's Page.

It will feature ICICX's cartoon characters and offer creative, and amusing educational activities aimed at reinforcing ethical and responsible behaviors when children use computers and information systems.

I have been pro-active in my desire to impress upon young children the need to protect information on computers and to respect the intellectual property of others. Several years ago I developed, a local LLNL Computer Security Outreach Project that began when I volunteered as a result of LLNL Family Day Activities. The copyright to this work was eventually released by the Regents of the University of California, the U.S. DOE, and LLNL. The work was expanded upon and developed further during non-LLNL hours, resulting in the production of Chip & FriendsTM. This work was funded by and is copyrighted by the Atterbury Foundation, to which it was licensed. Chip & Friends was an effort to teach children in grades K-3 to be ethical and responsible users of computers. It consists of a video featuring puppets by Images In Motion; the video which is part of two 20 minute school presentations, is supplemented by a Teacher's Guide, a Parent's Guide, a Student Activity Book, a poster, and a small Chip plush hand puppet. The Chip & Friends materials are distributed by Computer Learning Foundation. [7]

VIII. Joining Forces -- Cooperative and Collaborative Efforts

Enlisting Chip & Friends to share information on ethical and responsible use of computers with young children was a good beginning. However, we need to continue and expand upon that effort. We need a myriad of people working together for the greater good of the inter-networked Global On-line Community. As Information Security Professionals, we need to share our expertise with the larger community. It in turn needs to embrace and foster information security, respect for intellectual property, ethical behavior, and responsible usage.

By joining forces we can accomplish a great deal. Everyone on earth should have access to the on-line inter-networked systems. By making such systems available to populations around the globe, we'll begin to tap an infinite potential for education.

As we continue to broaden our knowledge on using the communication technologies, let us at the same time, infuse our Global On-line Community with awareness, education, and training about responsible and ethical behavior.

ICICX/CISSRP urges all of us to share our expertise and knowledge within our local communities as well as with the larger on-line populations. We can join forces and cooperate. We can volunteer to address these essential subject areas in our local schools, at Parent Teacher Association (PTA) meetings, at community centers, at libraries, in our houses of worship, and in on-line discussion lists. Together, our forces joined, we can accomplish a great deal.

Here is just one example. A cooperative agreement between ICICX and the University of Hawaii at Hilo, was signed in February of 1996, when CSATI -- Center for Strategic Advancement for Telematics and Informatics[©] was formed. The Center was established to promote intellectual innovation in the development and deployment of the interconnected communications elements in all areas of telematic and informatic technology. CSATI's objectives include creating new relationships that will blend and synergize academic research, the business community, government, and industry.

We cordially invite persons and organizations wishing further information about ICICX and/or desiring to collaborate and cooperate with us to contact ICICX at:

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[4] "Totem and Taboo in Cyberspace," "A Question of Privacy," and "Why Hackers Do the Things They Do.": Journal of the National Computer Security Association, June 1996.

[5] American Society for Industrial Security (ASIS)
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